

APPLICATION FOR SUPPLEMENTAL PERMIT TO MODIFY SITE OPERATION

SCA/BARTON LANDFILL

INTRODUCTION/BACKGROUND

The SCA/Barton Landfill, located in a portion of the Southeast Quarter of Section 5, Township 4 North, Range 8 West in Madison County, Illinois is rapidly depleting on-site cover material. It will become necessary to obtain cover material from an off-site source for daily and intermediate cover for the balance of filling operations in the Phase III Fill Area, and for final cover in the Phase III and IV Fill Areas. Request is herein made for Supplemental Permit to use off-site material for these remaining cover requirements.

The remaining life of the permitted landfill site, as of August 1, 1981, is projected to be approximately twelve months based on an average daily refuse receipt volume of 1000 cubic yards per day and a six day work week operation. The associated daily and intermediate cover material requirement is approximately 55,000 cubic yards. The final cover requirement is approximately 60,000 cubic yards.

The proposed off-site source is an adjacent tract of 30 acres, more or less, located immediately west of the permitted landfill site as shown on the attached drawing number 74-119C-CM-1. Upon receiving the requested Supplemental Permit, SCA would execute an Option-to-Purchase this tract from Ruth M. Newton, the current owner.

Drawing number 74-119C-CM-1 indicates the topographic conditions on the permitted landfill site and the proposed off-site cover material tract as of June 10, 1981. Also shown are the property boundaries and the soil boring locations for the proposed off-site cover material tract.

US EPA RECORDS CENTER REGION 5



412392

## SOILS INVESTIGATIONS

Based upon available Illinois State Geological Survey maps and publications, the following geologic units are present regionally and are expected to exist locally at the site:

### Peoria Loess

The Peoria Loess is a light yellow-tan to grey fine sandy silt existing in thicknesses ranging from 15 to 50 feet along portions of the bluffs. The loess thins away from the bluffs and grades into brownish-grey clayey silt locally.

### Roxana Silt

The Roxana Silt is primarily loess, but contains some sand and commonly contains a colluvium of sand, silt and clay at its base. It varies in color from pinkish-tan to yellow-grey.

### Vandalia Till Member; Illinoian Glasford Formation

The Vandalia Till is a sandy, grey compact glacial till.

### Mulberry Grove Silt Member; Illinoian Glasford Formation

The Mulberry Grove Member is described as a thin, lenticular unit of calcareous silt with local lenses of sand and gravel.

### Smithboro Till Member; Illinoian Glasford Formation

The Smithboro Till is a grey till which contains higher silt content than does the Vandalia Till, and has a higher expandable content.

Five soil borings, located as shown on Drawing Number 74-119C-CM-1, were completed by John Mathes & Associates, Inc. at the subject site. The geologic units identified from these borings are summarized on the following figure. The actual boring logs are also attached.

It is apparent that as much as 35 feet of loess exists in the higher elevations of the site, ranging to less than 6 feet in the lower elevations. The upper 10 to 25 feet is bron in color and the lower portion is brownish grey to grey, with differing soil properties. The upper part is interpreted to represent the Peoria Loess, and the lower part, the Roxana Silt. The borings show from zero (0) to nine (9) feet of silty clay at the top of the column, overlain by a foot of topsoil, which is considered to have resulted from the admixture of slopewash during the last stages of loess deposition.

Underlying the loess are 6 to 16 feet of till. Grain size and stratigraphic position indicate that the till is the Vandalia Till Member of the Galsford Formation. This unit is underlain by interglacial sediments including lacustrine clays and fluvial sands and silts, all of which are considered to belong to the Mulberry Grove Silt Member. Till was encountered below these deposits and likely is the Smithboro Till Member of the Illinoian Glasford Formation (see attached Geologic Columns).

#### SITE DEVELOPMENT & OPERATION

Under normal circumstances, SCA owned equipment will be used for excavation, hauling and placement of all cover material obtained off-site at the subject site. The currently available equipment on-site includes: 1-dozzer, 1-scraper, 1-end loader and 1-road grader. When necessary, additional equipment will be rented for final cover application. However, given favorable weather conditions, 40 - 50% of the operating time of equipment normally on-site can be dedicated to the application of final cover.

Final cover for the existing landfill would be obtained from the silty clay layer occuring immediately below the topsoil in the northern half of the subject site. Based on borings B-1A, B-2A, B-3A and B-11, this formation ranges in depth from

5 feet to 10 feet. Approximately 100,000 cubic yards of silty clay are available for use as final cover.

Daily cover and intermediate cover would be obtained from the Peoria Loess layer located beneath the silty clay layer in the northern half of the site, and below the topsoil in the southern half of the site. Ten to twenty-five feet of this material can be found over the entire site, providing an excess of 500,000 cubic yards of daily and intermediate cover material.

500 —  
—  
490 —  
—  
480 —  
—  
470 —  
—  
460 —  
—  
450 —  
—  
440 —  
—  
430 —  
—  
420 —  
—  
410 —

B-11

B-1A

B-2A

B-3A

B-4A

B-5A

- TOPSOIL
- ▨ SILTY CLAY (SLOPE)
- ▩ PEORIA LOESS
- ▧ ROXANA SILT
- ▨ GLACIAL TILL
- ▩ MULBERRY GROVE
- ▩ LACUSTRINE CLAY
- ▽  
3 WATER LEVEL AT COMPLETION
- ▽  
3 WATER LEVEL AFTER 24 HOURS

DRY  
3

DRY  
3

WC  
DC

GEOLOGIC COLUMNS

# RECORD OF SUBSURFACE EXPLORATION



PROJECT Barton Landfill Addition

BORING 1A

DRILLED BY Roberts

LOGGED BY Maxeiner

DATE DRILLED 4-14-81

PIEZOMETER Yes

CONTRACT 994-81

DRILLING METHOD Hollow Auger

DEPTH (FT.)	SAMPLE NUMBER	SAMPLE TYPE	NOTES	DESCRIPTION OF MATERIAL	BLOWS	K (cms/sec)	SHEAR STRENGTH, TSF SV Δ OP/2 C QU/2 C	WATER CONTENT, %
				SURFACE ELEVATION <u>490.9</u>				
				Br Si CLAY w/Roots, TOPSOIL				
				Brown Silty CLAY w/Silt Pockets, Oxidized Spots, Stains, Concretions, Trace Fine Sand				
5	1	SS			4-8			
10	2	3T	Adv. 30" Rec. 28"	Brownish-Gray Clayey SILT w/Oxidized Spots, Stains, Trace Fine Sand				
	3	SS			7-7	5.9x 10 <sup>-6</sup>		
15	4	SS		-Orange Brown @ 13.9' -w/Oxidized Concretions From 13.9' To 15.5'	4-5			
20	5	SS			2-3			
25	6	SS		-Brown @ 24.0'	2-4			
30	7	3T	Adv. 30" Rec. 26.5"	-Gray Below 29.0'		4.3x 10 <sup>-8</sup>		
	8	SS			2-3			
35	9	SS		Cont'd	2-3			

GROUND WATER DEPTH AT COMPLETION 38.5' AFTER 24 hrs. 25.5' AFTER 66 hrs 24.1'

SCALE 1" = 5.0'

JOHN MATHES & ASSOCIATES, INC.

# RECORD OF SUBSURFACE EXPLORATION



PROJECT Barton Landfill Addition BORING 1A (Cont'd)

CONTRACT <u>994-81</u>		DATE DRILLED <u>4-14-81</u>		DRILLED BY <u>Roberts</u>				
DRILLING METHOD <u>Hollow Auger</u>		PIEZOMETER <u>Yes</u>		LOGGED BY <u>Maxeiner</u>				
DEPTH (FT.)	SAMPLE NUMBER	SAMPLE TYPE	NOTES	DESCRIPTION OF MATERIAL	BLOWS	DRY UNIT WEIGHT PCF	SHEAR STRENGTH, TSF SV $\Delta$ OP/2      QU/2 C 0      0.5      1.0      1.5      2.0 +2      WATER      CONTENT, % 0      20      40      60      80	
	9	SS	Till Below 38.5' Wet	Gray Clayey SILT w/Oxidized Spots, Stains, Trace Fine Sand				
40	10	SS		Brownish-Olive Silty CLAY w/Sand, Oxidized Spots, Stains, Trace Gravel	4-5			
45	11	SS		-Yellowish-Brown Below 44.0'	3-4			
50	12	SS	Encoun-tered water @ 44.5'		14-19			
55				TOB				

GROUND WATER DEPTH AT COMPLETION \_\_\_\_\_ AFTER \_\_\_\_\_ AFTER \_\_\_\_\_

SCALE 1" = 5.0'

**JOHN MATHES & ASSOCIATES, INC.**

# RECORD OF SUBSURFACE EXPLORATION



PROJECT Barton Landfill Addition

BORING 2A

Roberts

DRILLED BY

4-16-81

DATE DRILLED

CONTRACT 994-81

Maxeiner

LOGGED BY

Yes

PIEZOMETER

Hollow Auger

DRILLING METHOD

DEPTH (FT.)	SAMPLE NUMBER	SAMPLE TYPE	NOTES	DESCRIPTION OF MATERIAL	BLOWS	K (cms/sec)	SHEAR STRENGTH, TSF SV OP. 2 OU 2 0 0.5 1.0 1.5 2.0 2.5	WATER CONTENT, % 0 20 40 60 80 100
				SURFACE ELEVATION <u>496.6</u>				
				Br Si CLAY w/Roots, TOPSOIL				
				Brown Silty CLAY w/Oxidized Spots, Stains, Trace Root Holes				
5	1	SS			4-2			
10	2	SS		Brown Clayey SILT w/Oxidized Stains -Trace Root Holes @ 9.0'	5-5			
15	3	SS	Damp To Moist		3-5	9.1X 10-7		
20	4	SS		-Trace Fine Sand Below 19.0'	4-5			
25	5	SS		-w/Oxidized Spots Below 24.0'	4-4			
30	6	SS		-Brownish-Gray Below 29.0'	2-3			
35	7	SS		Brownish-Gray Si Sa CLAY w/Oxidized Spots, Stains -Trace Gravel @ 34.0'	3-3			
				Cont'd				

GROUND WATER DEPTH AT COMPLETION Dry AFTER 16 hrs 45.3' AFTER

SCALE 1" = 5.0'

JOHN MATHES & ASSOCIATES, INC.